UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Northwest Region
7600 Sand Point Way N.E., Bldg. 1
Seattle, WA 98115

Refer to NOAA Fisheries Nos:
2004/00670 (Cantilevered Sheet Pile Installation)
2004/00824 (Bank Excavation and Backfill)

September 10, 2004

Lawrence C. Evans
Chief, Regulatory Branch
Department of the Army,
Portland District, Corps of Engineers
Post Office Box 2946
Portland, Oregon 97208-2946

Re: Endangered Species Act Interagency Consultation and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Consultation for the Port of Portland, Terminal 4, Cantilevered Sheet Pile Wall Installation and Bank Excavation and Backfill, Willamette River, Willamette River/Columbia River HUC, Multnomah County, Oregon (Corps Nos. 200400386 and 200400521)

Dear Mr. Evans:

The enclosed document contains a biological opinion and conference opinion (Opinion) prepared by NOAA's National Marine Fisheries Service (NOAA Fisheries) pursuant to section 7(a)(2) of the Endangered Species Act (ESA) on the effects of the issuance of a permit under section 10 of the Rivers and Harbors Act and section 404 of the Clean Water Act for cantilevered sheet pile wall and bank excavation and backfill activities at the Port of Portland's Terminal 4, Slip 3, along the Willamette River. In this Opinion, NOAA Fisheries concludes that the proposed action is not likely to jeopardize the continued existence of ESUs considered in this biological opinion. The Opinion also includes an incidental take statement with terms and conditions necessary to minimize the impact of taking that is reasonably likely to be caused by this action. Take from actions by the action agency and applicant, if any, that meet these terms and conditions will be exempt from the ESA take prohibition.

This document also includes the results of our consultation on the action's likely effects on essential fish habitats (EFH) pursuant to section 305(b) of the Magnuson-Stevens Fishery Conservation and Management Act (MSA), and includes conservation recommendations to avoid, minimize, or otherwise offset potential adverse effects to EFH. Section 305(b)(4)(B) of the MSA requires Federal agencies to provide a detailed written response to NOAA Fisheries within 30 days after receiving these recommendations. If the response is inconsistent with the recommendations, the U.S. Army Corps of Engineers must explain why the recommendations will not be followed, including the justification for any disagreements over the effects of the action and the recommendations.

If you have questions regarding this consultation, please contact Dr. Nancy Munn of my staff in the Oregon State Habitat Office in Portland, Oregon, at 503-231-6269.

Sincerely,

for Michael R Course

D. Robert Lohn
Regional Administrator

cc: Marla Harrison, Port of Portland
John Barco, U.S. Army Corps of Engineers
Dan Cary, Oregon Department of State Lands

Endangered Species Act – Section 7 Consultation
Biological Opinion & Conference Opinion

&

Magnuson-Stevens Fishery Conservation and Management Act
Essential Fish Habitat Consultation

Port of Portland, Terminal 4,
Cantilevered Sheet Pile Wall Installation and Bank Excavation and Backfill,
Willamette River, Willamette River/Columbia River HUC,
Multnomah County, Oregon

Lead Action Agency:	U.S. Army Corps of Engineers
Consultation Conducted By:	NOAA's National Marine Fisheries Service, Northwest Region
Date Issued:	September 10, 2004

for Michael R Crouse

Issued by:

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D. Robert Lohn
Regional Administrator

NOAA Fisheries Nos.:	**F/NWR/2004/00670 (Cantilevered Sheet Pile Installation)** **F/NWR/2004/00824 (Bank Excavation and Backfill)**

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INTRODUCTION

The biological opinion and conference opinion (Opinion) and incidental take statement of this consultation were prepared by NOAA Fisheries in accordance with section 7(a)(2) the Endangered Species Act (ESA) of 1973, as amended (16 USC 1531 *et seq*.), and implementing regulations at 50 C.F.R. 402. The essential fish habitat (EFH) part of this consultation was prepared in accordance with section 305(b)(2) of the Magnuson-Stevens Fishery Conservation and Management Act (MSA) (16 USC 1801 *et seq*.) and implementing regulations at 50 C.F.R. 600. The administrative record for this consultation is on file at the Oregon State Habitat Office in Portland, Oregon.

Background and Consultation History

The U.S. Army Corps of Engineers (Corps), Portland District, is evaluating two applications from the Port of Portland (Port) with activities at Slip 3 in Terminal 4 along the lower Willamette River. The Corps is reviewing the applications under their regulatory authority found in section 10 of the Rivers and Harbors Act and section 404 of the Clean Water Act. In the first permit application, the Port proposes to install a cantilevered sheet pile wall in the Willamette River; in the second application, the Port proposed to excavate and backfill the bank as part of a clean-up action pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended, 42 U.S.C. §9601, *et. seq.* (CERCLA). The bank grading is considered part of the upland clean-up which is a state-lead process under the direction of the Oregon Department of Environmental Quality (DEQ). The Port currently has a permit to conduct maintenance dredging (COE #2000-984) and to maintain their fender pile system (COE #2003-318) at this facility.

The Port is proposing to install a cantilevered sheet pile wall at Terminal 4, Slip 3, in the lower Willamette River within the designated boundary of the Portland Harbor Superfund Site. The L-shaped wall would run under the pier and along the riverbank at the head of the slip. It would provide structural stability to the pier, the sediments, and the bank under the pier. Sheet pile would be placed at the head of Slip 3 to protect the riverbank from scouring and sloughing caused by vessel movement. The proposed action would allow the Port to: (1) Dredge the toe-slope which abuts the sheet pile wall, extends into Berths 410 and 411, and grounds large ships during low water periods; and (2) excavate and cap contaminated sediments in Slip 3 in the future as part of the removal action work necessary to protect the public health, welfare, or the environment that the Port is conducting under the Terminal 4 Administrative Order on Consent for Removal Action (AOC). The Port entered the AOC with the U.S. Environmental Protection Agency (EPA) on October 2, 2003, pursuant to the CERCLA action described above.

In addition, the Port is proposing to excavate approximately 2,200 cubic yards of contaminated soil and approximately 2,200 cubic yards of clean soil, concrete structures, and associated piling from within the eastern bank of the Willamette River in Slip 3, and backfill the excavation with approximately 4,300 cubic yards of clean fill. The purpose of this work is to prevent the migration of petroleum hydrocarbons from the Terminal 4, Slip 3, upland facility to the

Willamette River at concentrations that could adversely affect beneficial uses. The bank activities are part of the remedy selected by the DEQ in the Record of Decision (ROD) and will be performed by the Port under a Consent Decree entered into with the DEQ.

Although these project are being considered by the Corps under two different permit applications, NOAA Fisheries has batched the consultation into a single Opinion because they are similar activities at the same location. NOAA Fisheries met with the Port several times during the winter and spring of 2004 to discuss the proposed actions. NOAA Fisheries reviewed preliminary design drawings and provided comments on proposed conservation measures.

In letters received by NOAA Fisheries on June 10, 2004 and July 23, 2004, the Corps determined that the proposed actions may adversely affect Lower Columbia River (LCR) Chinook salmon (*Oncorhynchus tshawytscha*), Columbia River chum salmon (*O. keta*), LCR steelhead (*O. mykiss*), Upper Willamette River (UWR) steelhead, and UWR Chinook salmon. The Corps also determined that the proposed actions may adversely affect EFH for Chinook salmon, coho salmon and starry flounder. In addition to steelhead and Chinook salmon, LCR coho salmon (*O. kisutch*) may occur within the project area. LCR coho salmon were recently proposed for listing as a threatened species (June 14, 2004, 69 FR 33102). A biological assessment (BA) addressing the potential for effects to these species was submitted to NOAA Fisheries.

Proposed Action

For purposes of this consultation, the proposed action is authorization to install a sheet pile wall and grade the bank at the Port of Portland's Marine Terminal 4, Slip 3.

Installation of the Sheet Pile Wall

Approximately 1,123 linear feet of cantilevered sheet pile wall would be installed behind the existing fender piles of Berths 410 and 411, and approximately 320 linear feet of cantilevered sheet pile wall would be installed at the head, or east end, of Slip 3. The piles would be driven to a maximum tip elevation of -80 feet Columbia River Datum (CRD). The Port is requesting the authorization to install the wall to stabilize the pier, the sediments, and the embankment beneath the pier to accommodate an immediate maintenance dredging need at the slip. At the same time, this project is designed to facilitate an acceleration of the Terminal 4 Early Action Project for the Portland Harbor Superfund Site pursuant to CERCLA. The removal action alternative for Slip 3 has not been finalized because characterization of the site and the extent of the contamination is ongoing. At this time, the most viable options for the future cleanup include various combinations of excavation and dredging of contaminated sediments within Slip 3, and capping of material underneath the existing pier.

The top elevation of the sheet pile wall installed behind the fender pile at Berths 410 and 411 would be completely submerged at an elevation of -20 feet CRD to allow for fish passage in the upper half of the water column. The top elevation of the wall along the head of the slope would be +6 feet CRD, which is approximately one foot above the existing pinch pile wall.

The wall would be constructed of steel sheet pile sections driven by a vibratory hammer to a tip elevation of -80 feet CRD. If an obstruction is encountered and the sheet pile cannot be advanced to the design penetration depth, the obstruction would be:

- Removed (if shallow or above the mudline) by crane with diver assistance; or
- Left in place if the structural integrity of the wall can be maintained by transferring the load with a horizontal structural member; or
- If the obstruction is determined to be a stiff soil layer, an impact hammer would be mobilized to impart enough energy to the sheet(s) to penetrate the stiff zone.

The sheet piles would be driven using barge-mounted equipment. The contractor may use various types of barges, including spud barges, to conduct wall installation. Spud barges contain steel posts (spuds) that are used to secure the barge to the bottom of the river. The spuds allow the barge to remain stationary, but may contribute to small, localized increases in turbidity. The barges are expected to stay in place during wall installation, thus minimizing the amount of turbidity caused by substrate disturbance due to spud deployment.

Work on the pier includes removal and reattachment of the fender system so that the sheet piles can be inserted into position and driven to depth. The steel would be delivered to Berth 414 or Terminal 2 and barged to the project site. Equipment staging would occur at Wheeler Bay (immediately north of Slip 3). Other activities on land would be parking and staging of crew and supply vehicles. Debris removed during pile driving would be lifted by crane onto a barge or nearby pier and then disposed of at an appropriate upland facility. Caution would be used to avoid the potential resuspension of contaminated sediments that may adhere to the debris.

Construction is expected to begin in December 2004 and be completed by October 31, 2005. Conservation measures described below are part of the proposed action and would be implemented as appropriate to avoid or minimize any potential impacts. They are designed to minimize and contain the resuspension of contaminated sediment, reduce acoustic disturbance, and address spill prevention and response.

<u>Conservation Measures for Sheet Pile Wall Installation</u>

- Sheet pile wall installation would be conducted during the Oregon Department of Fish and Wildlife (ODFW) in-water work window (July 1-October 31, and December 1 to January 31) to minimize potential effects to listed fish species through the avoidance of peak migration periods. Any work conducted at an elevation above the wetted water line that does not cause a disturbance below the ordinary high water line would not be considered in-water work.
- Sheet pile wall installation would be conducted with a vibratory hammer, except in circumstances where substrate conditions make it infeasible. Vibratory pile driving will be localized and of short duration.
- When impact drivers are necessary to install sheet piling, the smallest feasible or practical driver and the minimum force necessary will be used to complete the job. A

drop hammer or a hydraulic impact hammer will be used, when feasible, and the drop height will be set to the minimum necessary to drive the piles.

- When using an impact hammer to drive or proof sheet piling, one of the following sound attenuation devices will be used to reduce sound pressure levels by 20 decibels: (1) A block of wood or other sound dampening material will be placed between the hammer and the piling being driven; (2) the piling being driven will be surrounded by an unconfined bubble curtain that will distribute small air bubbles around 100% of the piling perimeter for the full depth of the water column; or (3) other sound attenuation devices will be used as approved in writing by NOAA Fisheries.
- Hydraulic jets will not be used to install sheet piles.
- The Port will provide visual monitoring at least once every four hours and document any nonaqueous phase liquid (NAPL) releases. Oil absorbent and containment booms will be available on-site during all phases of construction. These booms will be deployed immediately if NAPL releases are observed and then maintained during in-water work.
- The Port proposes to monitor turbidity visually at least once every four hours during in-water work to ensure that turbidity levels do not exceed state water quality standards. If, at any time, the visual turbidity levels are estimated to be approaching the turbidity exceedance criteria, field-testing will be performed.
- The Port will adhere to turbidity criteria as follows: (1) Turbidity shall not excced 5 NTU over background turbidity levels when background is 50 NTU or less; and (2) no more than a 10% increase in turbidity is allowed when background turbidity is more than 50 NTU. Any increases in turbidity caused by the proposed action will not exceed the turbidity criteria at a distance of 100 feet downstream from the turbidity-causing activity.
- If field-testing confirms turbidity criteria exceedances, then project operations responsible for causing the elevated turbidity will cease until corrective actions are taken to limit turbidity increases back to compliance levels. Work will not proceed until turbidity levels have dropped to an acceptable level.
- A spill prevention, control, containment plan will be prepared and implemented. All equipment used will be cleaned and inspected daily before use to ensure that the equipment has no fluid leaks. Should a leak develop during use, the leaking equipment shall be removed from the project site immediately and not used again until it has been adequately repaired. At no time will fuels or oils be allowed to enter any waterbody.
- If, at any time, fish are observed in distress or a fish kill occurs, operations will cease and NOAA Fisheries will be notified.

<u>Bank Excavation and Backfill</u>

Previous facility investigations have identified the presence, nature and extent of separate phase petroleum hydrocarbons as a light, non-aqueous phase liquid (LNAPL) at the Terminal 4, Slip 3, upland facility. The LNAPL presence is the result of petroleum product releases from historical storage and pipeline transportation activities at and near the site. Petroleum hydrocarbon seeps have been documented along the Terminal 4, Slip 3, upland facility riverbank since 1970. The estimate of the LNAPL accumulation in the soils at the upland was about 200,000 gallons, although the estimate has recently been modified; the Port believes that the original estimates were exaggerated because of well construction issues. Since at least the early 1990s, facility

investigations or attempts to address the petroleum contamination have been conducted by Union Pacific Railroad (UPRR), Chevron, Quaker State, and most recently the Port. These actions included: the removal and decommissioning of petroelum product pipelines including the removal of approximately 1,000 gallons of petroleum product from the pipelines; trenching; placement of an oil sorbent boom along the Slip 3 riverbank; and LNAPL recovery from wells within and upgradient of the riverbank. In 1999, the Port implemented an interim remedial action, which consisted of a dual-phase extraction system and additional measures intended to limit the migration of LNAPL to Slip 3. Because of these efforts, historical seeps of petroleum hydrocarbons into Slip 3 have been reduced to occasional sheens on the water surface. Investigations conducted in 2003 and 2004 have determined that only a very small volume of LNAPL is present and that this small volume is not present at sustainable recovery rates. Consequently, future LNAPL removal will be limited to monitoring and manual methods (*e.g.*, hand bailing from wells) when needed.

The Port's Remedial Investigation determined that petroleum hydrocarbons are present in the soils at depths of approximately 5 to 40 feet below the existing grade. Since the contamination does not include a significant soluble fraction, the entire remedial action selected by DEQ in its ROD focuses on preventing the separate phase hydrocarbons from reaching Slip 3. These include:

- Removal and off-site disposal of contaminated soil from the riverbank followed by backfill of the excavation area;
- Removal and monitoring of mobile LNAPL associated with a former petroleum product pipeline release near the central portion of the upland facility;
- Scraping and off-site disposal of a discrete area of shallow soil contamination in the vicinity of a former tank farm operated by Quaker State at the upland facility before the tank farm's closure and removal;
- Upland groundwater monitoring; and
- Facility management controls to identify residual contamination areas and provide appropriate management procedures.

Continued monitoring (and removal as needed) of LNAPL will be conducted to mitigate for possible future migration of residual LNAPL to the Willamette River. The shallow soil removal from the former Quaker State tank farm area is required by DEQ to prevent human exposure to surface soil containing petroleum hydrocarbons present above acceptable risk levels.

To excavate the riverbank, the Port proposes to isolate the work area, following appropriate conservation measures for the capture, handling and relocation of salmonids that may become stranded within the work isolation area.

The Port will excavate approximately 2,200 cubic yards of contaminated soil and approximately 2,200 cubic yards of clean soil, concrete structures, and associated piling, and backfill the excavation area with clean fill. The clean fill will include a combination of mechanically-stabilized earth fill, amended fill, borrow fill, filter gravel, and riprap. An existing stormwater

pipe will remain in place. Contaminated soil will be removed in a prism starting at elevation +20 feet NGVD extending to one foot below the silt layer contact, but not lower than +1.0 feet NGVD.

The excavation will occur during the low water stage (September through October), within the ODFW-designated in-water work window. Some excavation will occur in the water, but this excavation will be isolated using silt curtains. Only a small portion of the bank activities (mostly associated with removing the existing riprap) will be exposed to water. Excavation in the water is not anticipated to exceed one week in duration.

The excavation will extend east from the face of the riverbank for approximately 20 feet to accommodate construction equipment and provide a sufficient thickness of the adsorptive fill material. The south site of the excavation will be the south edge of Slip 3 and extend northward approximately 300 feet. After removal, the soil will be transported to an approved off-site facility and either treated or landfilled.

To ensure that potential hydrocarbon migration into Slip 3 is prevented, soil below an elevation of +17.7 feet NGVD will be amended with an adsorptive organoclay material and applied to provide adsorption capacity for petroleum hydrocarbons in the event of future mobilization of residual contamination. The replacement fill will provide a minimum width of 15 feet. The amended soil will consist of a mixture of 99% Columbia River dredge sand and 1% organoclay. The dredge sand meets the Dredge Management Evaluation Framework (DMEF) screening levels for inwater disposal. This adsorptive fill material will not impede groundwater flow, and will not alter stormwater quality or quantity. The adsorptive fill material will have the capacity to capture residual LNAPL upgradient of the region corresponding to the historical seep at the east end of Slip 3. Based on the petroleum hydrocarbon adsorption capacity, the adsorptive fill material will have a life span of 30 years before hydrocarbons migrate through this layer. However, continued monitoring will be conducted to ensure that future migration of residual LNAPL does not move into the bank fill area. Based on conservative calculations presented in the biological assessment, the total capacity for adsorbing petroleum hydrocarbons is 41,000 gallons for amended dredge sand. Although the original accumulation of LNAPL at the site was estimated to be 200,000 gallons, recent investigations suggest that only a very 'small' volume is currently present (using the original exaggerated estimate and the conservative assumption that 20 percent of that product may start heading towards the river, approximately 40,000 gallons of product may move toward the sand wedge).

Erosion and turbidity controls will be implemented before the removal of soil. Conservation measures, as described below, will include the installation of a silt fence, silt curtain and two adsorptive booms, with fish salvage activities to remove any fish that may be stranded behind the temporary silt curtain.

Excavation and filling activities are expected to be completed by October 31st. Some final bank restoration work will occur outside of the wetted area after that date. This includes activities

such as tree planting. Access to the site for the excavation and filling activities will be from the shore.

Non-native vegetation will be removed from the site using manual or mechanical practices without the use of chemical herbicides. The face of the bank will be restored using a combination of riprap, filter rock, topsoil and native vegetation. Native trees and shrubs will be planted along the upper portion of the bank. Herbicide use is proposed as a transitional tool to suppress weeds; herbicide use would be consistent with the Portland Parks Waterway Management Policy. The top soil applied will be stabilized using turf reinforcement mats. Riprap will be choked with filter gravel to reduce the size of the interstitial spaces with the intent of reducing piscivore habitat.

Project staging will occur from existing paved or graveled parking areas beside the site. Following excavation, the contaminated soil will be placed directly into trucks and transported to an off-site disposal landfill or thermal treatment facility. Spillage from the trucks will not be allowed.

Conservation Measures for Bank Excavation and Backfill

- An erosion and sediment control plan will be implemented to ensure water quality standards are met. Visual monitoring is proposed to ensure that state standards are not exceeded. If monitoring indicates a concern, correction action will occur immediately.
- Erosion control devices will be inspected on a routine basis. Stormwater catch basins will be protected during construction using filter fabric and biofilter bags. Erosion control devices will remain in place until the site is stabilized. Permanent stabilization methods may include permanent seeding and mulching, riprap protection, engineered stabilization structures, and/or bioengineered slope stabilization.
- If erosion controls are ineffective, work crews will be mobilized immediately (day or night), to make repairs, install replacements, or install additional controls as necessary.
- Only native vegetation will be used in the bank revegetation area. Soil layers will be covered with a turf reinforcement mat to augment the strength of the roots of the plantings.
- All in-water work will occur during the simmer in-water work window from July 1 through October 31. Work within the work isolation area will be performed in September or October.
- Earth removal activities will not occur within the wetted perimeter if the river stage height exceeds +4.0 feet NGVD.
- The biological assessment outlines measures for work area isolation and fish location. The project proponents anticipate fish salvage operations will be completed within one days, and will follow measures as described in the NOAA Fisheries biological opinion SLOPES II.
- A spill prevention, control and containment plan will be prepared and implemented. Equipment will be cleaned and inspected daily, and leaking equipment will be removed from the project site and repaired. No fuels or oils will be allowed to enter any waterbody. Construction equipment will be serviced, stored and fueled at least 100 feet

away from the shoreline. Floating hazardous material containment booms and spill containment booms will be maintained on site during all phases of the proposed action. The booms will be installed when there is potential for a toxic release.

- Herbicides will not be applied under wind conditions greater than six miles per hour, and the applicators will use a spray shield, coarse spray nozzle, or drift retardant to eliminate drift. Native planting will be protected with portable metal plant shields during all herbicide applications.

Action Area

'Action area' means all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action (50 C.F.R. 402.02). For purposes of this consultation, the action area the entire Marine Terminal 4, Slip 3, along the east bank of the lower Willamette River at river mile (RM) 4.7 in Portland, Oregon. The action area also includes Wheeler Bay, immediately downstream from Slip 3, in Terminal 4. Terminal 4 lies within the designated boundary of the Portland Harbor National Priority List (Superfund) site. The Terminal 4 facility is currently used for bulk loading of soda ash, and other commodities, automobile unloading for Toyota Motors, and occasional ship maintenance and break-bulk loading and unloading. Based on the potential for dispersion of sediments and any associated contaminants during a 6-hour tidal cycle, the action area extends 0.3 miles upstream of Slip 3 (RM 5.0) and 0.7 miles downstream from Slip 3 (RM 4.0).

The action area is used by the listed and proposed species described in Table 1. Both juveniles and adults of these ESUs can be found in the action area. There is no designated critical habitat within the action area. The action area is designated as EFH habitat for Chinook salmon, coho salmon, and starry flounder (PFMC 1998a, PFMC 1999), or is in an area where environmental effects of the proposed project may adversely affect EFH for those species.

ENDANGERED SPECIES ACT

The ESA establishes a national program for conserving threatened and endangered species of fish, wildlife, plants, and the habitat on which they depend. Section 7(a)(2) of the ESA requires Federal agencies to consult with U.S. Fish and Wildlife Service and NOAA's National Marine Fisheries Service (NOAA Fisheries), as appropriate, to ensure that their actions are not likely to jeopardize the continued existence of endangered or threatened species or adversely modify or destroy their critical habitats.

Section 9(a)(1) and protective regulations adopted pursuant to section 4(d) of the ESA prohibit the 'taking' of listed species without a specific permit or exemption. Among other things, an action that harasses, wounds, or kills an individual of a listed species or harms a species by altering habitat in a way that significantly impairs its essential behavioral patterns is a taking (50 C.F.R. 222.102). 'Incidental take' refers to takings that result from, but are not the purpose of, carrying out an otherwise lawful activity conducted by the Federal agency or applicant (50

C.F.R. 402.02). Section 7(o)(2) exempts any taking in compliance with the terms and conditions of a written incidental take statement from the taking prohibition.

Biological Opinion

This Opinion presents NOAA Fisheries' review of the status of each evolutionarily significant unit (ESU)[1] considered in this consultation and critical habitat, the environmental baseline for the action area, all the effects of the action as proposed, and cumulative effects. NOAA Fisheries analyzes those combined factors to conclude whether the proposed action is likely to appreciably reduce the likelihood of both the survival and recovery of the affected ESUs, or is likely to destroy or adversely modify critical habitat (see, 50 C.F.R. 402.14(g)). If the action under consultation is likely to jeopardize an ESU, or destroy or adversely modify critical habitat, NOAA Fisheries must identify any reasonable and prudent alternatives for the action that avoid jeopardy or destruction or adverse modification of critical habitat and meet other regulatory requirements (50 C.F.R. 402.02).

Status of the ESUs

This section defines range-wide biological requirements of each ESU, and reviews the status of the ESUs relative to those requirements. The present risk faced by each ESU informs NOAA Fisheries' determination of whether additional risk will 'appreciably reduce' the likelihood that an ESU will survive and recover in the wild. The greater the present risk, the more likely any additional risk resulting from the proposed action's effects on the population size, productivity (growth rate), distribution, or genetic diversity of the ESU will be an appreciable reduction (see, McElhaney *et al.* 2000).

Lower Columbia River Chinook Salmon ESU (Threatened)
In March 1999, LCR Chinook salmon were listed by NOAA Fisheries as threatened under the Federal ESA (64 FR 14308). The ESU includes all naturally-spawned populations of Chinook salmon in the Columbia River (and its tributaries) from its mouth at the Pacific Ocean upstream to a transitional point between Washington and Oregon east of the Hood River and the White Salmon River. The range also includes the Willamette River to Willamette Falls, and excludes spring-run Chinook salmon in the Clackamas River.

LCR Chinook salmon includes both fall-fun and spring-run stocks. Adults migrating to the Clackamas River may be present in the lower Willamette River starting in August and continuing through November, with peak migration occurring in September and October. Juveniles in this ESU would be expected in the lower Willamette River starting in March, continuing through July, with the peak occurring in April, May and June. The majority of fall-

[1] 'ESU' means an anadromous salmon or steelhead population that is either listed or being considered for listing under the ESA, is substantially isolated reproductively from conspecific populations, and represents an important component of the evolutionary legacy of the species (Waples 1991). An ESU may include portions or combinations of populations more commonly defined as stocks within or across regions.

run Chinook salmon juveniles emigrate to the ocean as subyearlings (Reimers and Loeffel 1967, Myers *et al.* 1998). The Clackamas River and other Willamette River tributaries below Willamette Falls, such as Johnson Creek and Abernathy Creek, have historically supported fall Chinook. However, most of the juveniles from this ESU that migrate through the lower Willamette River originate from the Clackamas River.

Threats to Chinook spawning and rearing habitat in the LCR ESU continue to be habitat degradation and loss due to extensive hydropower development projects, urbanization, logging, and agriculture.

UWR Chinook Salmon ESU (Threatened)

Adults from the UWR Chinook salmon ESU migrate through the action area beginning in March, and complete their migration by the end of July, with the peak between late April and early June. It is also possible that some adults hold for periods of time within the Portland Harbor. Chinook smolts would typically pass through the action area from January through June, and from August through December. Juveniles would be expected in the lower Willamette River anytime from March through mid-December. Information on the migratory behavior of subyearling Chinook is limited. Subyearling Chinook have been found in the harbor area over a longer period than other species of salmonids, probably because they actively feed during migration. Some juveniles may over-winter in the lower Willamette River.

LCR Steelhead ESU (Threatened)

This steelhead ESU occupies tributaries to the Columbia River between the Cowlitz and Wind Rivers in Washington and the Willamette and Hood River in Oregon, inclusive. Both summer and winter steelhead are present in this ESU.

Based on the updated information provided in the BRT report (BRT 2003), the information contained in previous LCR status reviews, and preliminary analyses, the number of historical and currently viable populations have been tentatively identified. Like the previous BRT, the current BRT could not conclusively identify a single population that is naturally self-sustaining. Over the period of the available time series, most of the populations are in decline and are at relatively low abundance. No population has a recent mean greater than 750 spawners. In addition, many of the populations continue to have a substantial fraction of hatchery origin spawners.

LCR steelhead move through the action area throughout the year. Peak adult movement is expected from late April through May. Out-migration of juveniles stars in April, peaks in May, and is comple by mid-July. Most steelhead smolts move downriver through the action area in less than one day, are predominantly 2+ years of age.

UWR Steelhead ESU (Threatened)

Populations of UWR steelhead are at relatively low abundance, and overall abundance of the ESU has been steeply declining since 1988, with adult returns improving in 2001 and 2002 (BRT 2003). It is uncertain whether the recent increases can be sustained. The previous BRT was

concerned about the potential negative interaction between non-native summer steelhead and wild winter steelhead (cited in BRT 2003). The loss of access to historical spawning grounds because of dams was considered a major risk factor.

UWR adults could be expected in the action area from January through mid-May. Smolts would be present from March through mid-July, with peak migration occurring in May.

CR Chum Salmon (Threatened)

Chum salmon are semelparous, spawning primarily in freshwater but spend more of their life in marine waters that any other Pacific salmonid. The species has the widest natural geographic and spawning distribution of any Pacific salmonid, primarily because its range extends further along the shores of the Arctic Ocean than other salmonids. Chum salmon may historically have been the most abundant of all salmonids: Neave (1961) estimated that before the 1940s, chum salmon contributed almost 50% of the total biomass of all salmonids in the Pacific Ocean.

In December 1997, the first status review of west coast chum salmon (Johnson *et al.* 1997) noted dramatic declines in the abundance of this ESU as well as significant restrictions in the distribution. The BRT was also concerned about the low productivity of the extant population. The updated status review states that close to 90% of the historic populations in the ESU are extinct or nearly so, resulting in loss of much diversity and connectivity between populations (BRT 2003). The populations that remain are small and overall abundance for the ESU is low. Unofficial reports for 2002 suggest a large increase in abundance in some locations (BRT 2003). The cause of this increase is not known, and the sustainability of the increase is not known.

Adult chum salmon may occur near the mouth of the Willamette River during their upstream migration from late September through December. They do not spawn in the Willamette River or its tributaries. Chum salmon fry may move into the lower Willamette River during incoming tides, and could feed on organisms within the action area for short periods during their downstream migration.

LCR Coho Salmon (Proposed Threatened)

On June 14, 2004, NOAA Fisheries proposed the LCR coho salmon as threatened under the ESA (69 FR 33102). The ESU includes all naturally-spawned populations of coho salmon from Columbia River tributaries below the Klickitat River on the Washington side and below the Deschutes River on the Oregon side, including the Willamette River as far upriver as Willamette Falls.

The BRT recently reviewed the status of the LCR coho salmon (BRT 2003). In the previous review concluded in 2001, the BRT was very concerned that over 90% of the historical populations in this ESU appeared to be extirpated or nearly so. The two populations with any significant production (Sandy and Clackamas) were at appreciable risk because of low abundance, declining trends, and failure to respond after a dramatic reduction in harvest. The most recent review was completed in 2003. Information collected for the review indicated that the ESU is dominated by hatchery-origin spawners, but there are some potential pockets of

natural production. The BRT agreed with earlier conclusions that only two populations have demonstrated appreciable levels of natural production, and added that both have experience recruitment failure over the last decade. From the 2001 review, there is only very limited information on the remainder of the 21 populations, but most were considered extirpated, or nearly so, during the low marine survival period of the 1990s. However, recently-initiated spawner surveys by ODFW and juvenile outmigrant trapping by Washington Department of Fish and Wildlife indicate there is some natural production in the lower Columbia River. Unfortunately, the majority of populations remain dominated by hatchery-origin spawners, and there is little data to indicate they would naturally persist in the long term (BRT 2003). In addition, other recent data suggest that small pockets of coho salmon may remain in tributaries in the lower Willamette River. While excluding fish from a small project on Kelley Creek (tributary to Johnson Creek) during August 2004, contractors for the City of Portland found 8 juvenile coho salmon.[2] Coho salmon may use small pockets of good habitat in the lower Columbia in greater numbers than expected.

Environmental Baseline

The environmental baseline includes the past and present impacts of all Federal, state, or private actions and other human activities in the action area, the anticipated impacts of all proposed Federal projects in the action area that have already undergone formal or early section 7 consultation, and the impact of state or private actions which are contemporaneous with the consultation in process (50 C.F.R. 402.02). For projects that are ongoing actions, the effects of future actions over which the Federal agency has discretionary involvement or control will be analyzed as 'effects of the action'.

NOAA Fisheries describes the environmental baseline in terms of the biological requirements for habitat features and processes necessary to support life stages of the subject ESUs within the action area. When the environmental baseline departs from those biological requirements, the adverse effects of a proposed action on the ESU or its habitat are more likely to jeopardize the listed species or result in destruction or adverse modification of critical habitat (NMFS 1999). The biological requirements of salmon and steelhead in the action area vary depending on the life history stage present and the natural range of variation present within that system (Groot and Margolis 1991, NRC 1996, Spence *et al.* 1996).

Generally, during spawning migrations, adult salmon require clean water with cool temperatures and access to thermal refugia, dissolved oxygen near 100% saturation, low turbidity, adequate flows and depths to allow passage over barriers to reach spawning sites, and sufficient holding and resting sites. Anadromous fish select spawning areas based on species-specific requirements of flow, water quality, substrate size, and groundwater upwelling. Embryo survival and fry emergence depend on substrate conditions (*e.g.*, gravel size, porosity, permeability, and oxygen

[2] Email from Jim Middaugh, City of Portland, to Nancy Munn, NOAA Fisheries (August 10, 2004)(commenting of fish species present during in-water work isolation for the Kelley Creek weir reconstruction).

concentrations), substrate stability during high flows, and, for most species, water temperatures of 13˚C or less. Habitat requirements for juvenile rearing include seasonally suitable microhabitats for holding, feeding, and resting. Migration of juveniles to rearing areas, whether the ocean, lakes, or other stream reaches, requires unobstructed access to these habitats. Physical, chemical, and thermal conditions may all impede migrations of adult or juvenile fish.

Each ESU considered in this Opinion resides in or migrates through the action area. Thus, for this action area, the biological requirements for salmon and steelhead are the habitat characteristics that would support successful rearing and migration.

Just below Willamette Falls, the Willamette River is naturally incised deep into steep bedrock walls that strongly confine the narrow channel. However, as the river approaches Portland, landform constraints become less severe and the river widens, with conditions increasingly influenced by the Columbia River. Historically, the reduced physical constraints allowed the formation of floodplains and off-channel habitats through Portland, with large off-channel lakes such as Guilds, Doane, and Ramsey (WRI 2004). Although floodplain widths in the lower Willamette were never as extensive as those in the middle and upper basin, their location at the dynamic transitional zone between the two major river systems and the scarcity of off-channel habitat for some distance upstream suggests that the ecological importance of these floodplains was high. In particular, the Columbia Slough and Sauvie Island formed a large floodplain wetland complex at the merging of the two rivers that provided extensive, high-quality habitat for large numbers and types of biota at this ecological crossroads.

Conditions in the channel and floodplain in the lower Willamette River have changed dramatically over the last 150 years. The channel has been deepened, narrowed, and simplified; the banks have been hardened and lined (WRI 2004). Floodplain and off-channel habitats have been filled and destroyed, and banks have been steepened throughout the length of the river within the City of Portland.

Patterns of river flow in the Willamette River at Portland are similar to patterns of flow in the upper Willamette Basin, which in general reflect seasonal variation in precipitation. The basin has a temperate marine climate with dry summers and wet winters. Annual minimum flows typically occur in August, and rapidly increase from October to December. The highest average flows occur from December to January. Patterns of flow in the Willamette River have changed dramatically over time, largely because of water management practices and the presence of dams (WRI 2004). Since the construction of the Willamette dams, there has been markedly higher median flows in the post-dam period over the summer and fall low flow periods; late summer and early fall flows are currently 2 to 2.5 times higher than pre-dam flows. In addition, since dam construction, the median flows exhibit sharp peaks during the early winter period, presumably because of dam releases that provide flood storage capacity in the reservoirs in preparation for the periods that historically had the high average flows. The presence of dams has also reduced the magnitude of peak flood events.

The Willamette River is tidally influenced at the project site. At RM 7, the river is about 1,500 feet wide, with a maximum depth of 60 to 70 feet. U.S. Army Corps of Engineer maps indicate that there are steep slopes to the dredged navigation channel approximately 150 feet offshore. In addition to Chinook salmon and steelhead, coho salmon, sockeye salmon, American shad, and white sturgeon occur in the area. Cutthroat trout are also present, but their abundance is low. Both juveniles and adults use the project area as a migratory corridor and as rearing habitat for juveniles.

The City of Portland and the ODFW are mid-way through a four-year study to evaluate relationships between fish communities and waterway developments. Two years of the collected data have been analyzed and are discussed here (ODFW 2003). Juvenile salmonids are present in the lower Willamette River during every month sampled. In both sampling years, the abundance of all juvenile salmonids increased beginning in November, peaked in April, and declined to near zero by July. Some of the larger juveniles may spend extended periods of time in off-channel habitat. Mean migration rates of juvenile salmonids ranged from 2.7 km/day for steelhead to 8.6 km/day for sub-yearling Chinook salmon. Residence time in the lower Willamette River ranged from 4.9 days for Chinook to 15.8 days for steelhead. Catch rates of juvenile salmonids were significantly higher at sites composed of natural habitat (*e.g.*, beach, rock) and alcoves, and juvenile salmonids tended to move along the east bank of the river.

Some scientists believe that the lower Willamette River does not have a unique, locally spawning population of salmonids. They believe, instead, that the lower Willamette River functions as a migration corridor and rearing grounds for populations throughout the entire Willamette subbasin (WRI 2004). Others, however, believe that tributaries such as Johnson Creek and Tryon Creek, support unique populations of salmonids.[3] Nevertheless, the EDT analyses described in the draft Willamette Subbasin Plan (2004) indicate that conditions in the lower Willamette River are an important bottleneck for populations throughout the Willamette Basin. The key limiting factors that arise from evaluation of these populations are habitat diversity, key habitat quantity, and chemical contamination and water quality (WRI 2004).

Habitat Diversity

Habitat conditions within the lower Willamette River are highly degraded. The streambanks have been channelized, off-channel areas removed, tributaries put into pipes, and the river has been disconnected from its floodplain as the lower valley was urbanized. Silt loading to the lower Willamette River has increased over historic levels due to logging, agriculture, road building, and urban and suburban development within the watershed. Limited opportunity exists for large wood recruitment to the lower Willamette River due to the paucity of mature trees along the shoreline, and the lack of relief along the shoreline to catch and hold the material. The banks of the river in the action area are heavily industrialized, with much of the bank hardened with riprap, vertical concrete walls, and docking facilities. Much of the historic off-channel

[3] Conversation with Mike Reed, City of Portland, January 21, 2004, during the monthly streamlining meeting.

habitat has been lost due to diking and filling of connected channels and wetlands. Columbia Slough, downstream from the project site, is the closest remaining off-channel habitat. Connections between the slough and the river have been cut off, and dikes have been constructed along much of the slough.

The river at Terminal 4 has been dredged to accommodate ships with deep drafts. No shallow water habitat is present. Since the terminal is fully developed as an industrial site, no riparian habitat is present, although recent work at the south end of Terminal 4 has added surface stormwater treatment facilities that includes trees and shrubs along the shoreline.

In summary, habitat diversity and condition within the project area are not adequate to support the successful rearing and migration of salmonids.

Key Habitat Quantity

The key habitat feature for rearing juvenile salmonids is adequate shallow water habitat. Migrating juveniles appear to prefer shallow, beach areas, which are a rare habitat type in the lower Willamette River because of habitat alterations over the past 150 years. Furthermore, this habitat type, or other preferred habitat types, are not present in the project area.

Chemical Contamination and Water Quality

The lower Willamette River, from the mouth to RM 24.8 (encompassing the project area), is currently on the DEQ 303(d) list as water quality limited for fecal coliform, biological criteria, dieldrin, aldrin, DDT/DDE, polychlorinated biphenyls (PCBs), polycyclic aromatic hydrocarbons (PAHs), mercury, manganese, iron, pentachlorophenol, and temperature (during the summer months)(DEQ 2004). In the lower Willamette River, the seven-day-average maximum temperature exceed 68°F and no cold water refugia are available. Results from DEQ ambient monitoring data indicate that 68% of the values at RM 7, and 61% of the values at RM 13.2 collected during the summer exceed the temperature standard.

The Portland Harbor, including the action area, was added to the Federal Superfund cleanup list in December 2000 based on the level of contamination in the sediments throughout the reach. The Portland Harbor Superfund site currently covers a 5.7-mile section of the Willamette River from the upstream end of Sauvie Island (rivermile 3.5) to Swan Island (rivermile 9.2). Pollutants introduced through industrial discharges, toxics carried by stormwater, and other local and upstream sources have contributed to elevated levels of many urban pollutants. Preliminary assessments indicate that DDT, PCBs, PAHs, and heavy metals are some of the key risk drivers for both fish and humans (Weston 1998). Cleanup of the contaminated sediments is presently being addressed under the Federal Superfund process. In addition, DEQ is leading the cleanup of the adjacent upland areas, including many of the sources of the sediment contamination. Skeletal deformities in fish upstream of Willamette Falls suggest that there may also be chemical contamination upstream of the Portland Harbor area.

Based on this information as well as information in the BA, the environmental baseline within the action area is not properly functioning and is not currently adequate to meet the needs of migrating or rearing salmonids.

Effects of the Action

'Effects of the action' means the direct and indirect effects of an action on the species or critical habitat, together with the effects of other activities that are interrelated or interdependent with that action, that will be added to the environmental baseline (50 C.F.R. 402.02). If the proposed action includes offsite measures to reduce net adverse impacts by improving habitat conditions and survival, NOAA Fisheries will evaluate the net combined effects of the proposed action and the offsite measures.

'Indirect effects' are those that are caused by the proposed action and are later in time, but still are reasonably certain to occur (50 C.F.R. 402.02). Indirect effects may occur outside the area directly affected by the action, and may include other Federal actions that have not undergone section 7 consultation but will result from the action under consideration. To be considered indirect effects, such actions must be reasonably certain to occur, as evidenced by appropriations, work plans, permits issued, or budgeting; follow a pattern of activity undertaken by the agency in the action area; or be a logical extension of the proposed action.

'Interrelated actions' are those that are part of a larger action and depend on the larger action for their justification; 'interdependent actions' are those that have no independent utility apart from the action under consideration (50 C.F.R. 402.02). Future Federal actions that are not a direct effect of the action under consideration, and not included in the environmental baseline or treated as indirect effects, are not considered in this Opinion.

Direct effects of the proposed action include the possibility of direct take during fish salvage activities, effects caused by increased turbidity, increased release of chemical contaminants from either the sediment or the adjacent bank or upland areas, effects to the food base for salmonids, acoustic disturbance, and effects caused by an accidental spill of oil or fuel, and herbicide use. A potential indirect effect may be increased predation rates on juvenile salmon as a result of habitat alterations.

Fish Salvage Activities

Project activities will occur during low water stage, from August through October, to minimize the potential for direct interaction between listed fish and project activities. Below the wetted perimeter of the Willamette River, a maximum of approximately 80 cubic yards of contaminated soil will be replaced with approximately 75 cubic yards of clean fill. The rest of the excavation and fill will occur above the wetted perimeter. Although unlikely, listed salmonids could become trapped within the work isolation area. Consequently, the applicant will use a temporary silt curtain to isolate the work area, and fish salvage activities will be implemented to inspect the isolation area for fish, and if necessary, capture, handle, and relocate listed salmonids that may become stranded behind the temporary silt curtain. An experienced fish biologist would relocate

any captured fish to a safe location downstream from the action area. Short-term stress and mortality of fish during relocation would be minimized through the incorporation of conservation measures described above. Any fish removed would experience high stress with the possibility of up to 5% delayed mortality depending on the rescue method. Because listed fish are unlikely to be present in Slip 3, and because the physical and temporal extent of the in-water work is minimal, the effects of in-water work and fish handling are not expected to be significant over the long term.

Turbidity

There is a short-term and localized likelihood of turbidity increases during bank excavation and sheet pile driving activities. Although low levels of turbidity and short-term pulses of moderate turbidity may not harm salmonids, prolonged exposure to moderate and high turbidity levels can cause a number of negative environmental conditions for salmon, ranging from behavioral changes (Sigler *et al.* 1984) and sub-lethal impacts from the exposure to increased turbidity (Sigler 1988, Sigler *et al.* 1984, Kirn *et al.* 1986, Emmett *et al.* 1988, Servizi 1988), and increased mortality from predators. Examples include:

- Reduced light penetration, which in turn affects the reactive distance of juvenile and adult salmonids for food capture;
- increased straying rates of adult salmon;
- juvenile salmon forced from preferred habitat; and
- increased embryo mortality through deposition of fish sediments on spawning gravel.

The proposed action includes the use of silt curtains to minimize the extent of turbidity increases. Re-suspended sediments would settle out within the silt curtain in the immediate vicinity of the bank work. Additionally, very few salmonids are expected to be present in the action because work will be conducted when fish presence is low. A small increase in turbidity may occur during placement and removal of the silt curtain. Any changes in turbidity associate with the action should be short-term and limited in extent.

The removal of concrete structures, pilings, and additional structures will occur at or above +12 feet NGVD, which is above the water level. The silt curtains will remain in place for these activities, and all other upland work. The sediment and erosion control plan will be fully implemented during the bank excavation and fill activities to minimize erosion. The face of the bank will be restored using a combination of topsoil, riprap, and native vegetative plantings. The soil layers will be covered with a turf reinforcement mat that is designed to assist in erosion control.

The installation of the sheet pilings will occur within Slip 3, and the Port predicts that all turbidity increases will be limited to Slip 3. Their prediction is based on lower water velocities in the slip than in the main river channel, and typical rates of resuspension of sediment during the sheet pile installation.

In summary, implementation of conservation measures will minimize turbidity increases. No spawning habitat is present in the action area, and preferred habitats for juvenile rearing are not present. Salmonid migration will not be impeded by the low levels of turbidity predicted from the project activities. As a consequence, project-related turbidity increases will not result in adverse effects to feeding behavior, use of preferred habitat, or migration of adult or juvenile salmonids.

Chemical Contaminants

Sediments within the action area are contaminated with many different analytes, includes metals, pesticides, and PCBs. However, the primary contaminants within Slip 3 are petroleum hydrocarbons in the form of NAPL. NAPL includes compounds that are insoluble in water, and represent a common and problematic class of groundwater contaminants because of their difficulty to remove from groundwater and sediment. NAPLs can form plumes that originate from waste oil, stormwater from system pits, and other liquid wastes. Light NAPL or LNAPL, is less dense than water, and is comprised of petroleum-based related fuels and distrillates. DNAPL is denser than water, and includes synthetic chlorinated solvents, coal tars, and the heavy fractions of petroleum distillation.

Site investigations conducted by the Port in conjunction with DEQ have identified the presence and extent of LNAPL at the site. LNAPL contamination is a result of petroleum product releases from historic storage and pipeline transportation activities beside Slip 3. Over the past decade, the Port and other companies have initiated cleanup efforts to control the release of NAPL into the Willamette River. At this time, a small volume of residual LNAPL remains in localized areas of the upland subsurface, and the riverbank soil contains residual LNAPL from the seep. The upland NAPL does not appear to be migrating to the river at this time, however, the riverbank source could act as a continuing source of hydrocarbon contamination to the slip.

PAHs are a component of the NAPL in Slip 3. Although PAHs generally do not bioaccumulate in salmonids or other vertebrates, they may accumulate in the liver of fish chronically exposed to sediment-associated PAHs. While metabolism serves mainly as a pathway for the detoxification of PAHs, some of the metabolites are capable of causing deleterious effects in exposed animals and may possess carcinogenic, mutagenic, and cytotoxic activity.

One goal of the proposed action is to minimize or eliminate the exposure of salmonids to NAPL from the identified source, either directly or through their prey. However, the proposed action may result in short-term increases in exposure to NAPL and other toxic compounds. This could occur as sediments are suspended during in-water work, and releases may occur as a result of pile driving and other earth disturbing activities.[4] Exposure to chemicals such as PAHs, metals, phenols, DDT, and PCB would occur when sediment is resuspended, or if ground disturbance

[4] Conversation with Kevin Parrett of Oregon Department of Environmental Quality during a regular McCormick and Baxter Superfund site meeting (August 10, 2004) (describing the substantial sheens observed at the site during sediment cap placement).

increases the release rates of the chemical. Concentrations could be at or near levels that could result in effects to fish and/or their prey base. The proposed turbidity curtain and absorptive boom will limit resuspension of contaminants and migration of LNAPL to the work isolation area. LNAPL is light weight and tends to rise to the surface. Therefore, the absorptive boom should be an effective tool. An additional boom will be placed outside the wood pile bulkhead to provide additional protection, and the spill prevention, control and containment plan should minimize the risk of exposure from this pathway as well as from accidental spills.

Food Base/Invertebrates

Shallow water habitat is important in the lower Willamette River because it provides opportunity for feeding and rearing during migration, as well as refuge from the main river currents. The benthic invertebrates most commonly consumed by migrating juvenile salmonids are midge larvae (Chironomidae) and the amphipod *C. salmonis*. Both species have the ability to rapidly recolonize disturbed areas through active or passive drift, and they are able to reproduce rapidly.

C. salmonis is a detritus feeder that obtains its food by collecting surface material beside its tube. It prefers substrates consisting of fine sand mixed with organic silt (Holton *et al.* 1984). Project activities could temporarily reduce the suitability of the sediment for recolonization by *C. salmonis* by reducing the organic matter content of the sediments and altering the sediment particle size.

However, petroleum hydrocarbon contamination at the site has already reduced the suitability of the site for benthic invertebrate colonization, and the current abundance of organisms at the site is likely low. Therefore, the potential for reduced prey availability for salmonids because of disturbance or increased toxic exposure is low. Salmonid presence at the site is very low and is likely short-term, so the proposed action is not likely to reduce growth in juvenile salmon by limiting feeding opportunities.

Acoustic Disturbance

The Port proposes to use vibratory extractors to remove approximately 40 concrete structures and associated pilings at the east bank of Slip 3. The extractors will minimize the potential effects of acoustic disturbance to salmonids. Acoustic disturbance associated with the vibratory extractors is not expected to exceed ambient noise levels and will not significantly affect listed salmonids within the proposed action area.

The driving of the sheet piles can cause a considerable amount of noise. The impact of the weight causes sound waves to radiate outward. Acoustic disturbances associated with pile driving may potentially disrupt the foraging behavior of juvenile salmonids, cause them to move away from the shoreline, or delay migratory progress. This effect can be especially detrimental in the spring, when salmonid densities are high, and predation can have a significant effect on their survival (Anderson 1990). Another concern is that the sound may mask the sound of an approaching predator, and that salmonids may become habituated to the sound and fail to respond to predators. Furthermore, pile driving often generates intense sound pressure waves

that can injure or kill fish (Reyff 2003, Abbott and Bing-Sawyer 2002, Caltrans 2001, Longmuir and Lively 2001, Stotz and Colby 2001).

The type and size of the pile, the firmness of the substrate into which the pile is being driven, the depth of water, and the type and size of the pile-driving hammer all influence the sounds produced. Sound pressure is positively correlated with the size of the pile because more energy is required to drive larger piles. Steel piles also require more energy to drive than wood or concrete piles. Impact hammers produce intense, sharp spikes of sound that can easily reach levels that harm fishes, and the larger hammers produce more intense sounds. Vibratory hammers, on the other hand, produce sounds of lower intensity, with a rapid repetition rate.

The applicant intends to use pile drivers, fitted with vibratory hammers, to install the sheet pile. An impact hammer may be necessary to drive piles if installation activities encounter objects that cannot be installed otherwise. Fish respond differently to sounds produced by impact hammers than to sounds produced by vibratory hammers. Fish consistently avoid sounds like those of a vibratory hammer (Enger *et al.* 1993, Dolat 1997, Knudsen *et al.* 1997, Sand *et al.* 2000) and appear not to habituate to these sounds, even after repeated exposure (Dolat 1997, Knudsen *et al.* 1997). On the other hand, fish may respond to the first strikes of an impact hammer with a startle response, but then the startle response wanes and some fish remain within the potentially-harmful area (Dolat 1997). Compared to impact hammers, vibratory hammers make sounds that have a longer duration (minutes vs. milliseconds) and have more energy in the lower frequencies (15-26 HZ vs. 100-800 HZ) (Wursig *et al.* 2000, Carlson *et al.* 2001, Nedwell and Edwards 2002).

Air bubble systems can reduce the adverse effects of underwater sound pressure levels on fish, reducing sound pressure by as mush as 17 to 22 dB (Wursig *et al.* 2000, Longmuir and Lively 2001, Chirstopherson and Wilson 2002). If an impact hammer is necessary, the applicant intends to use a bubble curtain, or other sound attenuation devices, to the reduce the potential for effects to fish.

In summary, driving the sheet piles may result in negative effects to fish that could result in injury or death in fish, or in altered behavioral patterns. The applicant proposes to minimize the effects by timing the activity when fish densities are low, and through the use of sound attenuation devices.

Barge Use

Barges would be used for wall installation. The temporal extent will be short-term, and limited to off-peak fish migration periods. Furthermore, boat use is a normal activity in the slip, and fish predation rates associated with barge use is not expected to be any different from background.

The use of spuds to stabilize the crane barge during wall installation would have a low effect on water quality. This effect would be temporary. Turbidity plumes created by spud deployment and retrieval are expected to be small and localized to the project site, and should dissipate quickly. Therefore, the use of spuds is expected to be minimal and temporary.

Accidental Spill

The Port will implement conservation measures to minimize the risk of oil and fuel spills from oil equipment and platforms. The primary means of reducing risk is cleaning and inspecting equipment for leaks, and refueling in an area that will not allow the delivery of pollutants to surface water. Staging areas have been designated in areas that will allow for complete containment of accidental spills. Because of these measures, the potential for injury or harm to salmonids from a fuel spill is low.

Herbicide Use

If needed, chemical herbicides will be used as a transitional tool to suppress weeds until the proposed plantings are established. The contractor will spot apply glyphosate to target weeds using backpack sprayers. This may occur as often as once a year over ten years. Glyphosate is moderately persistent in soil, with an estimated half-life of 47 days. It strongly absorbs to most soil types and has a low potential for runoff or leaching. Glyphosate is slightly toxic to fish, and does not bioaccumulate in fish. Conservation measures will be incorporated into the spray program, which will minimize the risk of exposure toxic concentrations of glyphosate. While herbicide usage is not expected to result in a sublethal exposure for salmonids, sublethal effects may occur because of uncertainties associated with the mechanisms of effects to fish associated with herbicide use.

Predation

Northern pikeminnnow, largemouth bass, smallmouth bass and walleye, all residents of the lower Willamette River, have juvenile salmonids as a major component of their diet (ODFW 2003). Other resident species prey on juvenile salmonids to a lesser extent. The bass are opportunistic predators that may prey on juvenile salmonids, likely due to the overlap in rearing habitat. ODFW studies found that largemouth and smallmouth bass were captured at significantly higher rates at sites containing artificial structures (*e.g.*, riprap, pilings) than at sites with natural bank habitats (ODFW 2003). Smallmouth bass, in particular, prefer rocky habitats with large interstitial spaces that provide concealment.

Although riprap will be placed along the bank at the end of Slip 3, the interstitial spaces will be filled to prevent the formation of quality predator habitat. The abundance of predators in not expected to increase as a result of the proposed action because their preferred habitat will not be increased.

Cumulative Effects

'Cumulative effects' are those effects of future state or private activities, not involving Federal activities, that are reasonably certain to occur within the action area of the Federal action subject to consultation (50 C.F.R. 402.02). Cumulative effects that reduce the capacity of listed ESUs to meet their biological requirements in the action area increase the risk to the ESU that the effects of the proposed action on the ESU or its habitat will result in jeopardy (NMFS 1999).

NOAA Fisheries is not aware of any specific future non-Federal activities within the action area that would cause greater impacts to listed species than presently occurs. Industrial activities in the project vicinity will continue, and this will likely involve redevelopment of existing facilities, expansion of existing facilities, and new industrial development. The Port of Portland is planning a renovation of Terminal 4, and support of listed salmonids is being considered during their planning process.

Between 1990 and 2000, the population of Multnomah County increased by 2.6%.[5] Thus, NOAA Fisheries assumes that future private and state actions will continue within the action area, increasing as population density rises. As the human population in the action area continues to grow, demand for agricultural, commercial, or residential development is also likely to grow. The effects that new development have that are caused by that demand are likely to further reduce the conservation value of habitat within the action area.

Although quantifying an incremental change in survival for the ESUs considered in this consultation due to the cumulative effects is not possible, it is reasonably likely that those effects within the action area will have a small, long-term, negative effect on the likelihood of their survival and recovery.

Conclusion

After reviewing the best available scientific and commercial information regarding the biological requirements and the status of the ESUs considered in this Opinion, the environmental baseline for the action area, the effects of the proposed action, and the cumulative effects, NOAA Fisheries' concludes that the action, as proposed, is not likely to jeopardize the continued existence of these species.

These conclusions are based on the following considerations: (1) The proposed action will result in reduced exposure to NAPL and other toxic compounds over the long term as a result of source removal and installation of organoclay-amended soils; (2) installation of the sheet pile wall may result in releases of PAHs and other compounds but these will be limited in duration; (3) the applicant proposes conservation measures that will minimize the effects of increased turbidity, herbicide use, etc., thereby reducing the potential for harm to salmonids; (4) probability of a chemical spill is low; (5) an adequate re-vegetation plan will be implemented; and (6) the proposed action will not appreciably reduce the quality of habitat in the action area over the long-term.

Reinitiation of Consultation

Reinitiation of formal consultation is required and shall be requested by the Corps or by the Service, where discretionary Federal involvement or control over the action has been retained or

[5] U.S. Census Bureau, State and County Quickfacts, Multnomah County. Available at http://quickfacts.census.gov/qfd/

is authorized by law and: (a) If the amount or extent of taking specified in the incidental take statement is exceeded; (b) If new information reveals effects of the action that may affect listed species or critical habitat in a manner or to an extent not previously considered; (c) If the identified action is subsequently modified in a manner that has an effect to the listed species or critical habitat that was not considered in the biological opinion; or (d) If a new species is listed or critical habitat designated that may be affected by the identified action (50 C.F.R. 402.16).

To reinitiate consultation, contact the appropriate State Office Habitat Office of NOAA Fisheries and refer to the NOAA Fisheries Number assigned to this consultation (2004/00670 or 2004/00824).

Incidental Take Statement

The ESA at section 9 [16 USC 1538] prohibits take of endangered species. The prohibition of take is extended to threatened anadromous salmonids by section 4(d) rule [50 C.F.R. 223.203]. Take is defined by the statute as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct." [16 USC 1532(19)] Harm is defined by regulation as "an act which actually kills or injures fish or wildlife. Such an act may include significant habitat modification or degradation which actually kills or injures fish or wildlife by significantly impairing essential behavior patterns, including, breeding, spawning, rearing, migrating, feeding or sheltering." [50 C.F.R. 222.102] Harass is defined as "an intentional or negligent act or omission which creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding, or sheltering." [50 C.F.R. 17.3] Incidental take is defined as "takings that result from, but are not the purpose of, carrying out an otherwise lawful activity conducted by the Federal agency or applicant." [50 C.F.R. 402.02] The ESA at section 7(o)(2) removes the prohibition from any incidental taking that is in compliance with the terms and conditions specified in a section 7(b)(4) incidental take statement [16 USC 1536].

An incidental take statement specifies the impact of any incidental taking of listed species. It also provides reasonable and prudent measures that are necessary to minimize the effects of take and sets forth non-discretionary terms and conditions with which the action agency must comply to implement the reasonable and prudent measures.

However, the incidental take statement included in this conference opinion for LCR coho salmon does not become effective until NOAA Fisheries adopts the conference opinion as a biological opinion, after the listing is final. Until the time that the species is listed, the prohibitions of the ESA do not apply to LCR coho.

Amount or Extent of Take

The proposed action covered by this Opinion is reasonably certain to result in incidental take of listed species because it includes activities that will harm, injure, or kill individuals of the ESUs that are likely to be present in the action area while the actions are completed. Construction

activities conducted in the water and on the streambank will cause short-term, minor, and local increases in noise, sediment and other pollutants in the water. In juvenile rearing areas, these effects will limit seasonal microhabitats necessary for holding, feeding and resting. These effects will cause most fish to avoid the action area, although some juvenile and adult fish are likely be injured or killed by a combination of physical injury and impaired migration. Take caused by these habitat-related effects cannot be accurately quantified as a number of fish. This is because the relationship between habitat conditions and the distribution and abundance of those individuals in the action area is imprecise. In such circumstances, NOAA Fisheries uses the casual link established between the activity and a change in habitat conditions affecting the species to describe the extent of take as a numerical level of habitat disturbance.

Based on the analysis of effects, NOAA Fisheries expects the sound pressure waves to result in incidental take of some cohorts of rearing and migrating fish found in the in-river repair areas. The scientific literature indicates that most of the species using this area would be migrating salmon and steelhead, and most cohorts of the listed ESUs spend little time in the area affected by the proposed action. While some fish are likely to avoid areas of long term, repeated disturbance, impact hammers do not elicit an avoidance response in fishes; therefore, fish may remain within the sound pressure wave field potentially exposing them to harmful sound wave pressure. Thus, NOAA Fisheries expects that a low density (<.01%) of juveniles within each sound wave pressure field will be incidental taken during pile installation. NOAA Fisheries based its take estimate on a formula used in NOAA Fisheries biological opinion for the Benicia-Martinez New Bridge Project to estimate take associated with pile driving. If the pressure waves extend beyond Slip 3, additional incidental take likely would occur beyond the extent exempted by this incidental take statement and the Corps would need to reinitiate consultation pursuant to 50 CFR 402.12.

The bank excavation and fill work will result in a temporary loss of near-shore habitat, and will temporarily displacing some juvenile salmon and steelhead. Increased turbidity within Slip 3 is not likely to result in lethal take of salmon and steelhead; it is more likely to induce avoidance behavior and other changes to migratory and rearing patterns. Sheet pile driving may increase release rates of PAHs and other contaminants. The extent of take associated with exposure to these compounds is limited to Slip 3.

When the amount of incidental take is unquantifiable, NOAA Fisheries identifies an extent of incidental take. The extent of incidental take for this action is limited to: (1) Increased turbidity and sound pressure waves associated with the installation of 1,123 linear feet of sheet pile wall along Berths 410 and 411, and 320 feet of sheet pile wall along the east end of Slip 3, (2) modification of the 3,600 square feet of bank below ordinary high water at the east end of Slip 3, and (3) disturbance of the approximately 360,000 square feet of sediments in Slip 3 that could release contaminants during sheet pile installation. The extent of take associated with turbidity is limited to no greater than 5 NTU over background turbidity when background is 50 NTU or less, or no more than a 10 percent increase in turbidity when background is greater than 50 NTU. Modification of habitat in excess of the amount described above is not authorized under this take

exemption and would require reinitiation of consultation. The temporal extent of take is limited to the 2 months that are required to complete the in-water portions of the project.

Further, NOAA Fisheries anticipates that juvenile salmonids of the ESUs considered in this consultation may be injured or killed because of capture and release efforts associated with work area isolation. Based on the estimated density of juvenile salmonids living in and around the piers of Slip 3, and allowing for up to 5% mortality caused by capture, no more than 30 individuals may be captured to complete this project and no more than 2 juvenile salmonids may be killed.

Reasonable and Prudent Measures

Reasonable and prudent measures are non-discretionary measures to avoid or minimize take that must be carried out by cooperators for the exemption in section 7(o)(2) to apply. The Corps has the continuing duty to regulate the activities covered in this incidental take statement where discretionary Federal involvement or control over the action has been retained or is authorized by law. The protective coverage of section 7(o)(2) may lapse if the Corps fails to exercise its discretion to require adherence to terms and conditions of the incidental take statement, or to exercise that discretion as necessary to retain the oversight to ensure compliance with these terms and conditions. Similarly, if any applicant fails to act in accordance with the terms and conditions of the incidental take statement, protective coverage may lapse.

The following reasonable and prudent measures are necessary and appropriate to minimize take of listed species resulting from completion of the proposed action. These reasonable and prudent measures would also minimize adverse effects to critical habitat, if any.

The Corps shall:

1. Ensure completion of a comprehensive monitoring and reporting program to confirm this Opinion is meeting its objective of minimizing take from permitted activities.
2. Avoid or minimize incidental take from construction-related activities by applying permit conditions that require completion of construction, operation and maintenance actions with minimum harm to aquatic and riparian systems.

Terms and Conditions

To be exempt from the prohibitions of section 9 of the ESA, the Corps and its cooperators must comply with the following terms and conditions, that implement the reasonable and prudent measures described above. Partial compliance with these terms and conditions may invalidate this take exemption or lead NOAA Fisheries to a different conclusion regarding whether the proposed action will result in jeopardy or the destruction or adverse modification of critical habitats.

1. To implement Reasonable and Prudent Measure #1 (monitoring), the Corps shall ensure that:

   a. Salvage notice. The following notice is included as a permit condition:

      > NOTICE. If a sick, injured or dead specimen of a threatened or endangered species is found, the finder must notify the Vancouver Field Office of NOAA Fisheries Law Enforcement at 360.418.4246. The finder must take care in handling of sick or injured specimens to ensure effective treatment, and in handling dead specimens to preserve biological material in the best possible condition for later analysis of cause of death. The finder also has the responsibility to carry out instructions provided by Law Enforcement to ensure that evidence intrinsic to the specimen is not disturbed unnecessarily.

   b. Implementation monitoring report required. The permittee submits an implementation monitoring report to the Corps and to NOAA Fisheries, at the address below, within 120 days of completing all in-water work. The monitoring report will describe the permittee's success meeting his or her permit conditions.
      i. If the in-water work will not be completed by January 31 following the year during which consultation was completed, the permittee shall submit a report to the Corps and to NOAA Fisheries by January 31 saying why the in-water work was not complete.
      ii. Submit a copy of the monitoring report or explanation of why work was not completed to the Oregon State Habitat Office of NOAA Fisheries, at the address above.

   c. Implementation monitoring report contents. Each monitoring report will include the following information.
      iii. Project identification
         (1) Permittee name, permit number, and project name.
         (2) Project location, including any compensatory mitigation site(s), by 5th field HUC and by latitude and longitude as determined from the appropriate USGS 7-minute quadrangle map.
         (3) Corps contact person.
         (4) Starting and ending dates for work completed.
      iv. Habitat conditions. Photos of habitat conditions at the project and any compensation site or sites, before, during, and after project completion.[6]
         (1) Include general views and close-ups showing details of the project and project area, including pre and post construction.

[6] Relevant habitat conditions may include characteristics of channels, eroding and stable streambanks in the project area, riparian vegetation, water quality, flows at base, bankfull and over-bankfull stages, and other visually discernable environmental conditions at the project area, and upstream and downstream from the project.

(2) Label each photo with date, time, project name, photographer's name, and a comment about the subject.

v. Project data.

(1) Work cessation. Dates work ceased due to high flows or high turbidity, if any.

(2) Pollution control. A summary of pollution and erosion control inspections, including any erosion control failure, contaminant release, and correction effort.

(3) Site preparation.

(a) Total cleared area – riparian and upland.

(b) Total new impervious area.

(4) Site restoration. Photo or other documentation that site restoration performance standards were met.

d. Reinitiation contact. To reinitiate consultation, contact the Oregon State Habitat Office of NOAA Fisheries, at the address above.

2. To implement reasonable and prudent measure #2 (construction-related activities), the Corps shall:

a. Project Design. The design of this project must be reviewed to ensure that impacts to natural resources have been avoided, minimized and mitigated, and that the following overall project design conditions are met.

i. Minimum area. Construction impacts will be confined to the minimum area necessary to complete the project.

ii. In-water work. All work within the Willamette River will be completed within the in-water work period (July 1 through October 31, and December 1 through January 31);

iii. Work period extensions. Extensions of the in-water work period, including those for work outside the wetted perimeter of the river but below the ordinary high water mark must be approved in writing by biologists from NOAA Fisheries.

b. Water Quality Plan, Pollution and Erosion Control Plan. Increased turbidity as bank excavation, pile driving,and other in-water work is a concern. Prepare and carry out a pollution and erosion control plan to prevent increased turbidity caused by such activities. The plan must be available for inspection on request by NOAA Fisheries. The pollution and erosion control plan will contain the pertinent elements listed below, and meet requirements of all applicable laws and regulations.

i. The names and address of the party(s) responsible for accomplishment of the water quality and pollution and erosion control plan.

ii. Describe methods or best management practices (BMPs) that will be used to minimize turbidity increases as a result of piling driving and bank excavation. Silt curtains and floating booms will be deployed, as

necessary, during in-water work to maintain the water quality standards described below.

iii. Practices to prevent erosion and sedimentation associated with streambank grading, equipment and material storage sites, fueling operations, and staging areas. A sediment or silt fence must be installed and maintained on the downslope site of the bank grading activities. Seeding outside of the growing season (mid-November through February) will not be considered adequate nor permanent stabilization.

(1) Practices to confine, remove and dispose of excess concrete, cement, grout, and other mortars or bonding agents, including measures for washout facilities.

(2) A description of any regulated or hazardous products or materials that will be used for the project, including procedures for inventory, storage, handling, and monitoring.

(3) A spill containment and control plan with notification procedures, specific cleanup and disposal instructions for different products, quick response containment and cleanup measures that will be available on the site, proposed methods for disposal of spilled materials, and employee training for spill containment.

(4) Practices to prevent construction debris from dropping into the cove or river, and to remove any material that does drop with a minimum disturbance to the riverbed and water quality.

iv. The in-water activities shall not cause turbidity of the Willamette River to exceed the turbidity criteria at a distance of 100 feet downstream from the turbidity-causing activity. The turbidity criteria are as follows:

(1) Turbidity shall be no greater than 5 NTU over background turbidity when background is 50 NTU or less; or

(2) No more than 10% increase in turbidity when background turbidity is more than 50 NTU.

(3) Background turbidity shall be established by collecting seven independent turbidity measures, at a minimum, during a two-day period before construction. Mean turbidity values will be used to represent background.

v. Turbidity shall be monitored during active in-water work period with a turbidity meter that is calibrated daily (calibration measures must be documented and available for review on request). Monitoring points shall be an undisturbed site 100 feet upstream of the activity and 100 feet downstream from the slip. In addition, monitoring points at the point of discharge shall be collected at the bottom, midlevel and top of the water column.

vi. Turbidity shall be measured and recorded at least once every four hours during in-water work. The first sample of the day will be taken four hours after the initiation of the in-water activity, and once at each four-hour

interval thereafter. If the turbidity criteria is exceeded, work will not proceed until the turbidity level has dropped to an acceptable level.

vii. Visual monitoring must occur at least once every four hours during in-water work. If, at any time, the visual turbidity levels are estimated to be approaching the turbidity exceedance level, field-testing will be performed. If field testing confirms turbidity criteria exceedances, then the contractor will cease operations responsible for causing the elevated turbidty.

viii. The BMPs will be evaluated and modified (when applicable) throughout the construction period to assure that the water quality standards are met. BMP modifications may include deployment of addition sediment control devices.

ix. A description of the hazardous products or materials that will be used, including inventory, storage, handling, and monitoring.

x. A spill containment and control plan with notification procedures, specific clean up and disposal instructions for different products, quick response containment and clean up measures will be available on site, proposed methods for disposal of spilled materials, and employee training for spill containment.

xi. Containment booms must be deployed during all in-water work to capture sheens that may result from sediment-disturbing activities.

c. Isolation of in-water work area. The work area will be isolated from the work area using inflatable bags, sandbags, sheet pilings, sediment curtains, or similar materials. All listed salmonids trapped within the isolation area will be removed and placed in the actively-flowing river using methods described in 1d.

d. Capture and release. Attempts to capture and release fish from the isolated area using trapping, seining, electrofishing, or other methods as are prudent to minimize risk of injury.

i. The entire capture and release operation must be conducted or supervised by a fishery biologist experienced with work area isolation and competent to ensure the safe handling of all ESA-listed fish.

ii. Do not use electrofishing if water temperatures exceed 18°C.

iii. If electrofishing equipment is used to capture fish, comply with NOAA Fisheries' electrofishing guidelines.[7]

iv. Handle ESA-listed fish with extreme care, keeping fish in water to the maximum extent possible during seining and transfer procedures to prevent the added stress of out-of-water handling.

v. Transport fish in aerated buckets or tanks.

vi. Release fish into a safe release site as quickly as possible, and as near as possible to capture sites.

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[7] National Marine Fisheries Service, *Backpack Electrofishing Guidelines* (December 1998) (http://www.nwr.noaa.gov/1salmon/salmesa/pubs/electrog.pdf).

vii. Do not transfer ESA-listed fish to anyone except NOAA Fisheries personnel, unless otherwise approved in writing by NOAA Fisheries.

viii. Obtain all other Federal, state, and local permits necessary to conduct the capture and release activity.

ix. Allow NOAA Fisheries or its designated representative to accompany the capture team during the capture and release activity, and to inspect the team's capture and release records and facilities.

e. Heavy Equipment. Restrict use of heavy equipment as follows:

i. Choice of equipment. When heavy equipment will be used, the equipment selected will have the least adverse effects on the environment (*e.g.*, minimally-sized, low ground pressure equipment).

ii. Vehicle and material staging. Store construction materials, and fuel, operate, maintain, and store vehicles as follows.

(1) To reduce the staging area and potential for contamination, ensure that only enough supplies and equipment to complete a specific job will be stored on-site.

(2) Complete vehicle staging, cleaning, maintenance, refueling, and fuel storage in a vehicle staging area placed 150 feet or more from any stream, waterbody, or wetland, unless otherwise approved in writing by NOAA Fisheries.

(3) Inspect all vehicles operated within 150 feet of any stream, waterbody or wetland daily for fluid leaks before leaving the vehicle staging area. Repair any leaks detected in the vehicle staging area before the vehicle resumes operation. Document inspections in a record that is available for review on request by Corps or NOAA Fisheries.

(4) Before operations begin and as often as necessary during operation, steam clean all equipment that will be used below bankfull elevation until all visible external oil, grease, mud, and other visible contaminates are removed.

(5) Diaper all stationary power equipment (*e.g.*, generators, cranes, stationary drilling equipment) operated within 150 feet of any stream, waterbody or wetland to prevent leaks, unless suitable containment is provided to prevent potential spills from entering any stream or waterbody. Use vegetable oil or other environmentally-sensitive lubricant for any vehicle that enters the water.

f. Construction discharge water. Treat all discharge water created by construction (*e.g.*, concrete washout, pumping for work area isolation, vehicle wash water, drilling fluids) as follows:

i. Water quality. Design, build and maintain facilities to collect and treat all construction discharge water, including any contaminated water produced by drilling, using the best available technology applicable to site

conditions. Provide treatment to remove debris, nutrients, sediment, petroleum hydrocarbons, metals, and other pollutants likely to be present.

ii. Discharge velocity. If construction discharge water is released using an outfall or diffuser port, velocities may not exceed 4 feet per second, and the maximum size of any aperture may not exceed 1 inch.

g. Plantings. Prepare and carry out the site restoration plan as necessary to ensure that the streambank is stable and appropriately planted. Make the written plan available for inspection on request by the EPA or NOAA Fisheries.

i. Goal. The goal of the bank layback and plantings is the production of habitat elements such as large wood, riparian vegetation for food, cover and shelter, and shading.

ii. Streambank shaping. The grading shall occur consistently with the proposed grading plan to restore a natural slope and profile suitable for the establishment of vegetation.

iii. Plants. Complete the plantings by the end of 2005. Use a diverse assemblage of species native to the project site, including grasses, forbs, shrubs and trees. Noxious or invasive species may not be used. However, a certified sterile, non-native seed mix may be used for erosion control the first year, if necessary.

iv. Pesticides. Take of ESA-listed species caused by pesticide use is included in the incidental take statement. Pesticide use is limited in type and extent, as described in the proposed action.

v. Fertilizer. Do not apply fertilizer (including fertilizers within the hydroseed mix) within 50 feet of the Willamette River.

vi. Fencing. Install fencing as necessary to prevent access to revegetated sites by unauthorized persons or by equipment during future construction.

MAGNUSON-STEVENS FISHERY CONSERVATION AND MANAGEMENT ACT

The consultation requirements of section 305(b) of the MSA direct Federal agencies to consult with NOAA Fisheries on all actions, or proposed actions, that may adversely affect EFH. Adverse effects include the direct or indirect physical, chemical, or biological alterations of the waters or substrate and loss of, or injury to, benthic organisms, prey species and their habitat, and other ecosystem components, if such modifications reduce the quality or quantity of EFH. Adverse effects to EFH may result from actions occurring within EFH or outside EFH, and may include site-specific or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions (50 C.F.R. 600.810). Section 305(b) also requires NOAA Fisheries to recommend measures that may be taken by the action agency to conserve EFH.

The Pacific Fishery Management Council designated EFH for groundfish (PFMC 1998a), coastal pelagic species (PFMC 1998b), and Chinook salmon, coho salmon, and Puget Sound pink salmon (PFMC 1999). The proposed action and action area for this consultation are described in the Introduction to this document. The action area includes areas designated as EFH for various

life-history stages of coho salmon, Chinook salmon and starry flounder (PFMC 1998b, PFMC 1999). The effects of the proposed action on EFH are as follows.

- Increased turbidity at the site and downstream during construction
- Potential of chemical contamination

EFH Conservation Recommendations

Pursuant to section 305(b)(4)(A) of the MSA, NOAA Fisheries is required to provide EFH conservation recommendations to Federal agencies regarding actions which may adversely affect EFH. While NOAA Fisheries understands that the conservation measures described in the BA will be implemented by the Corps it does not believe that these measures are sufficient to address the adverse impacts to EFH described above. However, the terms and conditions outlined in the Opinion are generally applicable to designated EFH for the species designated in the Proposed Actions section of this EFH consultation, and address these adverse effects. Consequently, NOAA Fisheries incorporates Term and Condition #2 from the Biological Opinion here as EFH conservation recommendations.

Statutory Response Requirement

Federal agencies are required to provide a detailed written response to NOAA Fisheries' EFH conservation recommendations within 30 days of receipt of these recommendations. The response must include a description of measures proposed to avoid, mitigate, or offset the adverse affects that the activity has on EFH. In the response is inconsistent with the EFH conservation recommendations, the response must explain the reasons for not following the recommendations, including the scientific justification for any disagreements over the anticipated effects of the proposed action and the measures needed to avoid, minimize, mitigate, or offset such effects.

Supplemental Consultation

The Corps must reinitiate EFH consultation with NOAA Fisheries if the proposed action is substantially revised in a way that may adversely affect EFH, or if new information becomes available that affects the basis for NOAA Fisheries' EFH conservation recommendations [50 C.F.R. 600.920(l)].

DATA QUALITY ACT DOCUMENTATION AND PRE-DISSEMINATION REVIEW

Section 515 of the Treasury and General Government Appropriations Act of 2001 (Public Law 106-554) ("Data Quality Act") specifies three components contributing to the quality of a document. They are utility, integrity, and objectivity. This section of the Opinion addresses these Data Quality Act (DQA) components, documents compliance with the DQA, and certifies that this Opinion has undergone pre-dissemination review.

Utility: This ESA section 7 consultation on the Cantilevered Sheet Pile Wall Installation and Bank Excavation and Backfill at Port of Portland's Terminal 4, Slip 3, in Multnomah County, Oregon, concluded that the action will not jeopardize the continued existence of LCR steelhead, LCR Chinook salmon, UWR steelhead, UWR Chinook Salmon, CR chum salmon, or LCR coho salmon, a species proposed for listing under the ESA. Therefore, the Corps may authorize that action. Pursuant to the MSA, NOAA Fisheries provided the Corps with conservation recommendations to conserve EFH.

The intended users of these consultations are the Corps and the applicant. Clients of the Port of Portland and the American public will benefit from the consultation.

Individual copies were provided to the above listed entities. This consultation will be posted on the NOAA Fisheries NW Region web site (http://www.nwr.noaa.gov). The format and naming adheres to conventional standards for style.

Integrity: This consultation was completed on a computer system managed by NOAA Fisheries in accordance with relevant information technology security policies and standards set out in Appendix III, "Security of Automated Information Resources," Office of Management and Budget Circular A-130; the Computer Security Act; and the Government Information Security Reform Act.

Objectivity:

Information Product Category: Natural Resource Plan.

Standards: This consultation and supporting documents are clear, concise, complete, and unbiased; and were developed using commonly accepted scientific research methods. They adhere to published standards including the NOAA Fisheries ESA Consultation Handbook, ESA Regulations, 50 C.F.R. 402.01 et seq., and the MSA implementing regulations regarding EFH, 50 C.F.R. 600.920(j).

Best Available Information: This consultation and supporting documents use the best available information, as referenced in the literature cited section. The analyses in this biological conference opinion/EFH consultation contain more background on information sources and quality.

Referencing: All supporting materials, information, data and analyses are properly referenced, consistent with standard scientific referencing style.

Review Process: This consultation was drafted by NOAA Fisheries staff with training in ESA and MSA implementation, and reviewed in accordance with Northwest Region ESA quality control and assurance processes.

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Table 1. Federal Register Notices for Final Rules that list species, designate critical habitat, or apply protective regulations to ESUs considered in this consultation. (Listing status 'T' means listed as threatened under the ESA, 'E' means listed as endangered, and 'P' means proposed for listing; see, also, proposed listing determinations for 27 ESUs of West Coast salmonids, at 69 FR 33102, 6/14/04.)

Species ESU	Listing Status	Critical Habitat	Protective Regulations
Chinook salmon (*Oncorhynchus tshawytscha*)			
Lower Columbia River	T 3/24/99; 64 FR 14308	Not applicable	7/10/00; 65 FR 42422
Upper Willamette River	T 3/24/99; 64 FR 14308	Not applicable	7/10/00; 65 FR 42422
Chum salmon (*O. keta*)			
Columbia River	T 3/25/99; 64 FR 14508	Not applicable	7/10/00; 65 FR 42422
Coho salmon (*O. kisutch*)			
Lower Columbia River	P 6/14/04; 69 FR 33102	Not applicable	Not applicable
Steelhead (*O. mykiss*)			
Lower Columbia River	T 3/19/98; 63 FR 13347	Not applicable	7/10/00; 65 FR 42422
Upper Willamette River	T 3/25/99; 64 FR 14517	Not applicable	7/10/00; 65 FR 42422